

## Contributors to this Issue

CHARLES R. BURROWS, B.S. in Electrical Engineering, University of Michigan, 1924; A.M., Columbia University, 1927; E.E., University of Michigan, 1935. Research Assistant, University of Michigan, 1922-23. Western Electric Company, Engineering Department, 1924-25; Bell Telephone Laboratories, Research Department, 1925-. Mr. Burrows has been associated continuously with radio research and is now in charge of a group investigating the propagation of ultra-short waves.

ARTHUR B. CRAWFORD, B.S. in Electrical Engineering, Ohio State University, 1928. Member of Technical Staff, Bell Telephone Laboratories, 1928-. Mr. Crawford has been engaged chiefly in work relative to radio communication by ultra-short waves.

CARL R. ENGLUND, B.S. in Chemical Engineering, University of South Dakota, 1909; University of Chicago, 1910-12; Professor of Physics and Geology, Western Maryland College, 1912-13; Laboratory Assistant, University of Michigan, 1913-14. Western Electric Company, 1914-25; Bell Telephone Laboratories, 1925-. As Radio Research Engineer Mr. Englund is engaged largely in experimental work in radio communication.

L. A. MEACHAM, B.S. in Electrical Engineering, University of Washington, 1929. Cambridge University, England, 1929-30. Bell Telephone Laboratories, 1930-. Mr. Meacham's work has been concerned with the generation and distribution of constant reference frequencies.

S. O. MORGAN, B.S. in Chemistry, Union College, 1922; M.A., Princeton University, 1925; Ph.D., 1928. Western Electric Company, Engineering Department, 1922-24; Bell Telephone Laboratories, 1927-. Dr. Morgan's work has been on the relation between dielectric properties and chemical composition.

WILLIAM W. MUMFORD, B.A., Willamette University, 1930. Bell Telephone Laboratories, 1930-. Mr. Mumford has been engaged in radio receiving work, chiefly on the problem of propagation and measurement in the ultra-short-wave region.

E. J. MURPHY, B.S., University of Saskatchewan, Canada, 1918; McGill University, Montreal, 1919-20; Harvard University, 1922-23.

Western Electric Company, Engineering Department, 1923-25; Bell Telephone Laboratories, 1925-. Mr. Murphy's work is largely confined to the study of the electrical properties of dielectrics.

A. C. NORWINE, A.B., University of Missouri, 1923; B.S. in Electrical Engineering, 1924; E.E., 1925. Bell Telephone Laboratories, 1925-. Mr. Norwine has been principally engaged in studies of the effects of transmission delay and voice operated devices on toll telephone circuits.

A. J. RACK, B.S. in Electrical Engineering, University of Illinois, 1930; M.A. in Physics, Columbia University, 1935. Bell Telephone Laboratories, 1930-. Starting with radio research, Mr. Rack has more recently been engaged in the analysis of special problems arising in amplifier circuits.

E. F. WATSON, M.E., Cornell University, 1914. American Telephone and Telegraph Company, Engineering Department, 1914-19; Department of Development and Research, 1919-34. Bell Telephone Laboratories, 1934-. Mr. Watson has been concerned with the development of various types of telegraph equipment, particularly teletypewriters, telephotograph equipment, telegraph maintenance and testing equipment, grounded telegraph systems and regenerative telegraph repeaters. His present work as Teletypewriter Engineer is along these same lines.

S. B. WRIGHT, M.E. in Electrical Engineering, Cornell University, 1919. Engineering Department and Department of Development and Research, American Telephone and Telegraph Company, 1919-34; Bell Telephone Laboratories, 1934-. Mr. Wright is engaged in transmission development of radio systems.